

ASCAT SCATTEROMETER WIND DATA PROCESSING

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The Metop-A satellite was launched on 19 October 2006 and carries the Advanced Scatterometer (ASCAT). The instrument is a real aperture, C band, vertically polarized radar with three fan beam antennas pointing to the left hand side of the sub-satellite track and three fan beam antennas pointing to the right hand side. Scatterometers are known to provide accurate mesoscale (25-50 km resolution) sea surface wind field information used in a wide variety of applications, including Numerical Weather Prediction (NWP) data assimilation, now-casting, and climate studies. The radar antenna geometry, the measurement noise, as well as non-linearities in the relationship between the backscatter

measurements and the wind vector complicate the wind retrieval process. In addition, scatterometers are sensitive to geophysical phenomena other than wind, such as confused sea state, rain, land & ice contamination of the radar footprint. These phenomena can distort the wind signal, leading to poor quality retrieved winds. As such, elimination of poor quality data is a prerequisite for the successful use of scatterometer winds.

An overview of the ASCAT scatterometer wind retrieval processing will be presented at the meeting. The presentation will focus on state-of-the-art quality control, inversion and noise filtering techniques. Also a view on future scatterometer systems and emerging (ocean) applications will be briefly discussed.

HF RADAR MONITORING INITIATIVE IN BARCELONA COASTLINE: CURRENTS AND WAVE MEASUREMENTS

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The coastline of Catalunya constitutes a valuable and vulnerable natural resource that requires an integrated and coordinated sustainable management effort. Several natural and human induced problems come together such as:

- High value coastal region having natural preservation as one of the its main assets associated to clean beaches and sports navigation
- Heavy populated area with strict water quality management and floating debris collecting requirements
- Sedimentation and erosion associated to coastal structures and harbours
- Climate change and environmental protection related studies

Coastal sustainable management has both an operational and a strategic function within the region. There is a long list of institutions and organisations that ensure that these environmental responsibilities are met in Catalunya, among them we can cite the following:

- Puertos del Estado, the Spanish Harbours Authority
- Autoritat Portuària de Barcelona, The Barcelona Harbour Authority
- Clavegueram de Barcelona (CLABSA),
- L'Agència Catalana de l'Aigua (ACA), Catalan Water Agency,
- El Servei Meteorològic de Catalunya, Catalan
- Direcció General de Ports, Aeroports i Costes, The General Directorate of Harbours, Airports and Coasts of Catalunya,

All of these institutions recognized the great value (and the necessity) that real time 2D surface currents information would have for their coastal management activity. As a consequence, all of them agreed to start a joint initiative to install a radar HF monitoring network based on SeaSonde technology that shall highlight benefits that can be provided to their institutions and to society in general. This step has also been understood by the Catalan planning authorities as part of a more general strategic plan to deploy region- wide ocean observing networks for a more sustainable environment management of the coastal ocean. The SeaSonde radar HF (High Frequency), based on the measurement of the Doppler shift of the electromagnetic wave scattered by the surface ocean roughness, was chosen for the initiative along the Barcelona waterfront because of its distinctive features its compactness and an impressive operational track

record. The small equipment and energy consumption footprints are keys for the environmental integration, especially in valuable spots along the coastline.

The initiative consisted on two Standard HF SeaSonde radars operating at a frequency centred at 25 MHz. One radial station was located at the east dock in Barcelona Harbour, the second radial station in the Masnou recreation Harbour. They were operating continuously for almost six months in year 2008: from July/ August to December. Each of the radial stations has an average range of around 35 Km; The radial current data has a spatial resolution of about 1 km and are obtained every hour, moreover, wave parameter (significant waveheight, direction and period), are obtained every half an hour on a real time basis. The combination of the radial vectors from each of the two sites give a 2D representation of the total hourly surface currents on the area over a spatial grid of 3Km horizontal resolution. An example of the surface currents maps obtained are shown in Fig 1.

A more complete description of the installation, system performance and an indication of the quality of the observations will be presented here, together with a qualitative comparison of the radar HF wave data against wave buoy measurements as well as a validation and comparison of surface currents against other source of measurement.

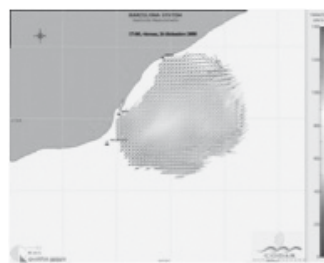


Fig 1 .2D surface vector currents



Fig 2. Detail of Antenna in Masnou Harbour